p-13 A SEM observation on the efficiency of the preparation of oval canals using hand and engine-driven instruments

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Ⅰ. Objectives

The purpose of this study was to evaluate the efficiency of the preparation of oval canals using hand and engine-driven instruments with SEM observations.

Ⅱ. Materials and Methods

Thirty single-rooted teeth with oval canal were used in this study. The teeth were divided into 3 groups. In group A, the teeth were prepared up to size 35 with K-file using RC-prep and irrigated with 5% NaOCl between each file size. In group B, the teeth were prepared with Profile according to the manufacture's instructions using RC-prep and irrigated with 5% NaOCl between each file size. In group C, the teeth were prepared with GT file according to manufacture's instructions using RC-prep irrigated with 5% NaOCl between each size file. Then, in all teeth a final flush of 5㎖ of distilled water was delivered for 30s. Canals were dried with sterile standardized paper points. After preparing the canals, the teeth were sectioned along their mesial and distal surfaces by using low-speed diamond disc, chisel and mallet. Each root section was then dehydrated in graded concentration of alcohol(70, 80, 90, 100%), mounted on an aluminum stub, sputter-coated with gold-palladium and observed with scanning electron microscope(HITACHI S-4200) in middle and apical area. Smear layer were subjected to a standardized semiquantitative evaluation in four grades, according to the classification of Gutmann et al.

Ⅲ. Results

1. In the middle area, group B and group C showed less smear layer than group A, and it was statistically significant.($p<0.05$)
2. In the middle area, group B showed greater smear layer than group C, but it was not statistically significant.($p>0.05$)
3. In the apical area, group C showed less smear layer than group A, and it was statistically significant.($p<0.05$)
4. In the apical area, group A showed greater smear layer than group B, but it was not statistically significant.($p>0.05$)
5. In the apical area, group B showed greater smear layer than group C, but it was not statistically significant.($p>0.05$)
6. In all groups, the middle area was less smear layer than the apical area, and it was statistically significant.($P<0.05$)

Ⅳ. Conclusions

In oval canal, rotary instruments produced less smear layer than hand instruments and the middle area showed less smear layer than the apical area of the root canals.